WHAT IS CLAIMED IS:

1. A computer-implemented method for restructuring a design model generated by a computer aided design system, the method comprising:

receiving at a computer a command to restructure the design model, the design model comprising a first hierarchical data structure interrelating a plurality of components and the command to restructure comprising a command to change a hierarchical relationship of a first subset of the plurality of components with respect to other ones of the plurality of components;

in accordance with the command to restructure, generating a new hierarchical data structure comprising a new hierarchical relationship between the plurality of model components;

determining other relationships between components in the first data structure hierarchy that are changed as a result of the command to restructure; and

dynamically updating the other relationships to preserve the other relationships subsequent to the generation of the new hierarchical relationship.

2. The method of claim 1 wherein the first hierarchical data structure comprises a plurality of parent-child relationships relating the plurality of components to a common root component, said parent-child relationships detailing a construction of the model.

3. The method of claim 2 wherein generating the new hierarchical data structure comprises changing a hierarchical path between the first subset and the root component.

4. The method of claim 3 wherein:

the other ones of the plurality of components comprises a first other component;

the other relationships comprise a first other relationship between one of the first subset of components and the first other component; and

the hierarchical path between the root component and the first other component is not changed as a result of the restructuring command.

5. The method of claim 4 wherein the first other relationship comprises a mate relationship and dynamically updating the other relationships comprises updating first other relationship data to maintain a mating between the one of the subset of components and the first other components.

6. The method of claims 5 wherein, prior to the restructure of the hierarchy, the first subset is a descendent of the first other components, and subsequent to the restructure, the first subset is not a descendent of the first other component.

7. The method of claim 4 wherein the first other relationship comprises an update relationship and dynamically updating the other relationships comprises updating data to maintain an updating relationship between the one of the first subset of components component and the first other component.

8. The method of claim 4 wherein the first other relationship establishes a size relationship between the one of the subset of components and the first other component.

9. The method of claim 4 wherein the first other relationship establishes a positional relationship between the one of the subset of components and the first other component.

10. The method of claim 1 wherein:
generating the new hierarchical data structure comprises generating a component list identifying a component moving to a new location; and

updating the other relationships comprises generating a reference list identifying the other relationships that are changed.

11. The method of claim 10 wherein generating a reference list comprises associating a reference location code with each relationship identified by the reference list, each reference location code identifying a change to a relationship to preserve design intent associated with the relationship.

12. The method of claim 1 wherein the first subset of components comprise a subassembly of the model.

13. A computer program residing on a computer-readable medium, comprising instructions for causing a computer to

receive a command to restructure a design model generated by a computer aided design system, the design model comprising a first hierarchical data structure interrelating a plurality of components and the command to restructure comprising a command to change a hierarchical relationship of a first subset of the plurality of components with respect to other ones of the plurality of components;

in accordance with the command to restructure, generate a new hierarchical data structure comprising a new hierarchical relationship between the plurality of model components;

determine other relationships between components in the first data structure hierarchy that are changed as a result of the command to restructure; and

dynamically update the other relationships to preserve the other relationships subsequent to generation of the new hierarchical relationship by the instructions to generate.

14. The program apparatus of claim 13 wherein the first hierarchical data structure comprises a plurality of parent-child relationships relating the plurality of components to a common root component, said parent-child relationships detailing a construction of the model.

15. The program apparatus of claim 14 wherein the instructions to generate the new hierarchical data structure comprise instructions to change a hierarchical path between the first subset and the root component.

16. The program apparatus of claim 15 wherein:
the other ones of the plurality of components comprises a first other component;
the other relationships comprise a first other relationship between one of the first subset of components and the first other component; and
the hierarchical path between the root component and the first other component is not changed as a result of the restructuring command.

17. The program apparatus of claim 16 wherein the first other relationship comprises a mate relationship and the instructions to dynamically update the other relationships comprise instructions to update the first other relationship data to maintain a mating between the one of the subset of components and the first other components.

18. The program apparatus of claims 17 wherein, prior to the restructure of the hierarchy, the first subset is a descendent of the first other components, and subsequent to the restructure, the first subset is not a descendent of the first other component.

19. The program apparatus of claim 16 wherein the first other relationship comprises an update relationship and the instructions to dynamically update the other relationships comprises instructions to update data to maintain an updating relationship between the one of the first subset of components component and the first other component.

20. The program apparatus of claim 16 wherein the first other relationship establishes a size relationship between the one of the subset of components and the first other component.

21. The program apparatus of claim 16 wherein the first other relationship establishes a positional relationship between the one of the subset of components and the first other component.

22. The program apparatus of claim 13 wherein:
the instructions to generate the new hierarchical data structure comprise instructions to generate a component list identifying a component moving to a new location; and
the instructions to update the other relationships comprises instructions to generate a reference list identifying the other relationships that are changed.

23. The program apparatus of claim 22 wherein the instructions to generate a reference list comprise instructions to associate a reference location code with each relationship identified by the reference list, each reference location code identifying a change to a relationship to preserve design intent associated with the relationship.

24. The method of claim 1 wherein the first subset of components comprise a subassembly of the model.

25. A computer aided drawing system comprising:
a database comprising a stored design model generated by a computer aided design system, the design model comprising a first hierarchical data structure interrelating a plurality of components;
an input device to exchange data with a user; and
a processor operatively coupled to the input device, to the database, and to a data storage medium, the data storage medium comprising instructions to configure the processor to:
receive from the input device a command to restructure the design model;
in response to the command to restructure, executing instructions to generate a new hierarchical data structure comprising a new hierarchical relationship by changing a hierarchical relationship of a first subset of the plurality of components with respect to other ones of the plurality of components;
determine other relationships between components in the first data structure hierarchy that are changed as a result of the command to restructure; and
dynamically update the other relationships to preserve the other relationships subsequent to generation of the new hierarchical relationship.

26. The program apparatus of claim 25 wherein the first hierarchical data structure comprises a plurality of parent-child relationships relating the plurality of components to a common root component, said parent-child relationships detailing a construction of the model.

27. The system of claim 26 wherein the instructions to generate the new hierarchical data structure comprise instructions to change a hierarchical path between the first subset and the root component.

28. The system of claim 27 wherein:

the other ones of the plurality of components comprises a first other component;

the other relationships comprise a first other relationship between one of the first subset of components and the first other component; and

the hierarchical path between the root component and the first other component is not changed as a result of the restructuring command.

29. The system of claim 28 wherein the first other relationship comprises a mate relationship and the instructions to dynamically update the other relationships comprise instructions to update the first other relationship data to maintain a mating between the one of the subset of components and the first other components.

30. The system of claims 29 wherein, prior to the restructure of the hierarchy, the first subset is a descendent of the first other components, and subsequent to the restructure, the first subset is not a descendent of the first other component.

31. The system of claim 28 wherein the first other relationship comprises an update relationship and the instructions to dynamically update the other relationships comprises instructions to update data to maintain an updating relationship between the one of the first subset of components component and the first other component.

32. The system of claim 28 wherein the first other relationship establishes a size relationship between the one of the subset of components and the first other component.

33. The system of claim 28 wherein the first other relationship establishes a positional relationship between the one of the subset of components and the first other component.

34. The system of claim 25 wherein:
the instructions to generate the new hierarchical data structure comprise instructions to generate a component list identifying a component moving to a new location; and
the instructions to update the other relationships comprises instructions to generate a reference list identifying the other relationships that are changed.

35. The system of claim 22 wherein the instructions to generate a reference list comprise instructions to associate a reference location code with each relationship identified by the reference list, each reference location code identifying a change to a relationship to preserve design intent associated with the relationship.

36. The system of claim 25 wherein the first subset of components comprise a subassembly of the model.